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Debt Sizing
LTV, DSCR and Debt Yield

Size a Commercial Real Estate Loan
Course Book

Six modules, one property, every figure computed.

Educational material. Not investment advice. Prepared with AI assistance.

About this course

This course sizes a commercial real estate loan the way a lender does, and builds every step in Excel. The running case is Harbor Point Logistics Park, Building A: a fictional 450,000 sq ft warehouse in Dallas-Fort Worth bought for $45.5m, the acquisition of the Real Estate Modeling course. Here its senior loan is sized again from first principles: the lender's NOI and lendable value, LTV and LTC, DSCR and the mortgage constant, the debt yield, the binding test; then the break-evens and sensitivities, the maturity test, a cash-out refinancing, the construction-to-permanent takeout of Building B, and the covenants and cash trap that follow the loan for ten years.

It is written for analysts and associates in commercial real estate lending, debt funds, CMBS and bank credit teams, for acquisition analysts on the equity side who must anticipate what a lender will offer, and for anyone preparing a credit memo. You need basic Excel and to know what NOI and a cap rate are.

Module	What you build in the Case Workbook
1. NOI and lendable value	Rebuild the NOI the lender will underwrite, the value it will lend against and the cost it will finance; then the LTV and LTC limits.
2. DSCR and the mortgage constant	Turn a rate and an amortization period into a mortgage constant, and the NOI into the largest loan a 1.30x DSCR allows.
3. Debt yield and the binding constraint	Add the debt yield, size the loan at the tightest of the four tests, round it down and prove every test on the final loan.
4. Break-evens and sensitivities	Find the value, rate, NOI and occupancy at which the answer changes, and run the loan through rate, cap rate and NOI tables.
5. Refinancing and the maturity test	Follow the loan to its balloon, test the refinancing at maturity, size a cash-out refinancing and a construction-to-permanent takeout.
6. Covenants and the cash trap	Test the loan every year against its cash management triggers, stress the NOI, measure the cash trapped and the paydown that cures it.

How to use this book

1. Read the module here: objectives, the lesson, the worked example on Building A, the pitfalls and the summary.
2. Build the module in the workbook: open its start file (Step_Files), fill the orange cells, then compare with the solution file and the Case Workbook.
3. Do the module tab of the Exercise Workbook: answers turn green or red, solutions are in hidden tabs.
4. Answer the three practice questions at the end of the module (answers at the end of the book), then the module quiz in the Quiz App or your learner account.
5. After module 6, take the certificate exam online: 40 questions, 60 minutes, 80% to pass, retake as often as you need.

Conventions

- $000 unless stated; rents and costs in $ per sq ft per year. Annual periods and annual payments, as in the Real Estate Modeling course.
- The Case Workbook has 477 live formulas and 11 checks with a master check. Inputs are blue on yellow, formulas black. No macro, no circular reference.
- Lender terms are illustrative assumptions of the case, chosen to be typical, not market quotes.

MODULE 1

NOI and lendable value

Rebuild the NOI the lender will underwrite, the value it will lend against and the cost it will finance; then the LTV and LTC limits.

Objectives

- Rebuild the lender's NOI from the sponsor's figures and say why it is lower.
- Find the lendable value as the lower of price and appraised value.
- Compute the loans allowed by LTV and LTC.

The lesson

Every sizing test starts from two numbers: the income the property can carry debt with, and the value or cost the loan rests on. Neither is the sponsor's number. The sponsor underwrites the building it hopes to own; the lender underwrites the building it might have to take back.

From the sponsor's NOI to the lender's NOI

NOI is effective gross revenue less operating expenses, before debt service, depreciation and income tax. The lender rebuilds it line by line and makes three kinds of change: a vacancy floor at the market level even when the building is full, because leases expire and tenants default over a ten-year loan; market management fees even when the sponsor manages the asset itself; and no credit for rent that is not signed. Many lenders then deduct replacement reserves and normalized leasing costs to reach net cash flow, and size the DSCR test on that lower figure. Underwriting adjustments only ever lower NOI or leave it unchanged.

Lendable value and cost

The appraiser values the building by capitalizing its in-place NOI. The lender lends against the lower of that appraised value and the price: it will not finance a premium the appraiser does not support, nor a value the buyer did not pay. LTV caps the loan as a share of that lendable value. LTC caps it as a share of what the sponsor actually spends: the price plus closing costs and any works the loan finances. LTC matters most for development and value-add loans, where cost and value differ widely.

Worked example: Building A, year 1

$000	Sponsor	Lender
Gross revenue (rent collected plus recoveries)	$3,592.50k	$3,592.50k
Vacancy and credit loss	1.0%: $35.9k	5.0%: $179.6k
Effective gross revenue	$3,556.6k	$3,412.9k
Recoverable and non-recoverable expenses	$1,080.0k	$1,080.0k
Management fee	2.5%: $88.9k	3.0%: $102.4k
NOI	**$2,387.66k**	**$2,230.49k**

1. The lender's NOI is $157.2k lower, a cut of 6.58%: 4.0 points of extra vacancy and 0.5 point of fee.
2. Appraised value = $2,387.66k / 5.25% = $45.48m, just below the price of $45.50m. Lendable value: $45.48m.
3. Loan allowed by LTV = 60% x $45.48m = $27.29m.

4. Total cost = $45.50m plus 1.5% of closing costs = $46.18m. Loan allowed by LTC = 65% x $46.18m = $30.02m.

Pitfalls

- Sizing on the sponsor's NOI: on Building A it overstates the loan by $1.66m.
- Using the appraisal when it is above the price.
- Applying LTC to the price alone and forgetting closing costs.
- Treating a full building as if it will stay full for ten years.

Summary

- NOI before debt service, depreciation and tax; the lender's version is lower.
- Lendable value = MIN(price, appraised value).
- LTV loan = LTV x lendable value; LTC loan = LTC x total cost.

Practice questions

1. Lender vacancy rises to 7.5%, all else equal. What happens to the LTV loan of Building A, and why?
2. Why does a lender ignore an appraisal that comes in above the price?
3. With LTC at 70% instead of 65%, what is the LTC loan?

In the workbook: the NOI and Value sheet; Step_1_NOI_Value_Start.xlsx and _Solution.xlsx; exercise tab M1.